

Nanedi Vallis:
Sustained Water Flow?
(P-49613)

This picture of a canyon on the Martian surface was obtained on January 8, 1998 by the Mars Orbiter Camera during Mars Global Surveyor's 87th orbit. It shows Nanedi Vallis, one of the valley systems that cuts through cratered plains in the Xanthe Terra region. The picture covers an area 9.8 by 18.5 kilometers (6.1 by 11.5 miles), and shows features as small as 12 meters (39 feet) in size. The canyon is about 2.5 kilometers (1.6 miles) wide. Rocky outcrops are found along the upper canyon walls; weathered debris is found on the lower canyon slopes and along the canyon floor.

The origin of this canyon is enigmatic. Some features seen near the top of the frame, such as terraces within the canyon and a small, 200-meter-wide (660-foot-wide) channel, suggest continual fluid flow and downcutting. Other features, such as the lack of a contributing pattern of smaller channels on the surface surrounding the canyon, box-headed tributaries, and the size and tightness of the apparent meanders, suggest formation by collapse. It is likely that both continual flow and collapse have been responsible for the canyon as it now appears. Further observations, especially to the west of the area in this image, will help separate the relative effects of these and other processes of potential formation and modification.

Mission Overview

Mars Global Surveyor was launched on November 7, 1996, and entered a highly elliptical orbit around Mars on September 11, 1997. The original mission plan called for using friction with the planet's atmosphere to reduce the orbit's size, leading to a two-year mapping mission from close circular orbit beginning in March 1998. Owing to difficulties with one of the two solar panels, aerobraking — the process of circularizing the spacecraft's orbit — has been extended to March 1999. Although global mapping will not begin until then, extensive scientific observations of Mars' northern hemisphere will be made from April to September 1998.

Malin Space Science Systems (MSSS) and the California Institute of Technology built the Mars Orbiter Camera using spare hardware from the Mars Observer mission. MSSS operates the camera from its facilities in San Diego, California. The Jet Propulsion Laboratory's Mars Surveyor Operations Project operates the spacecraft with its industrial partner, Lockheed Martin Astronautics, from facilities in Pasadena, California, and Denver, Colorado.

The Mars Surveyor Program

Mars Global Surveyor is the first venture in the National Aeronautics and Space Administration's (NASA's) Mars Surveyor Program, a new series of missions to explore the Red Planet. The Mars Surveyor Program will launch orbiters and landers every 25 months over the next decade, using advanced technology to develop a comprehensive portrait of Mars.

By studying Mars, the most likely planet for future human expeditions, scientists hope to better understand the formation and evolution of Earth and the inner solar system. This effort — which is affordable, engaging to the public, and of high scientific value — will infuse science, mathematics, and engineering into our nation's educational system. International participation and collaboration further enhance the value of the Mars Surveyor Program.

The Jet Propulsion Laboratory (JPL), a division of the California Institute of Technology, manages Mars Global Surveyor and the Mars Surveyor Program for NASA's Office of Space Science. JPL, NASA's lead center for automated space exploration, provides mission design and navigation, and manages mission operations.

A 34-meter antenna subnetwork of NASA's Deep Space Network tracks and acquires data from all the Mars spacecraft. Lockheed Martin Astronautics is the industrial partner for the Surveyor program.



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